

REMARKS

INTRODUCTION:

In accordance with the foregoing, no claims have been amended, and claims 15-17 have been added. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1-17 are pending and under consideration. Reconsideration is respectfully requested.

REJECTION UNDER 35 U.S.C. § 101

In the Office Action, at page 2, numbered paragraph 1, claims 1-4, 6-11, and 13 were rejected under 35 U.S.C. §101, for the reasons set forth therein. This rejection is traversed and reconsideration is requested.

The Office Action ("OA") states the following:

The claimed invention does not fall within at least one of the four categories of patent eligible subject matter recited in 35 U.S.C. 101. The claims appear drawn an embodiment of computer software (i.e. driver).

The Examiner has determined that the claimed inventions are not patentable subject matter without providing any specific reasoning beyond "claims appear drawn an embodiment of computer software" nor proffering any evidence to support such a conclusion. The Examiner is reminded that "[a]ny rejection based on lack of utility should include a detailed explanation why the claimed invention has no specific and substantial credible utility." MPEP § 2107.

"Whenever possible, the Examiner should provide documentary evidence regardless of publication date to support the factual basis for the prima facie showing of no specific and substantial credible utility." Id. Furthermore, "[i]f documentary evidence is not available, the Examiner should specifically explain the scientific basis for his or her factual conclusions."

By reason of said MPEP rule, it is respectfully submitted that the Office Action does not adequately state the grounds for a § 101 rejection.

Nevertheless, considering said rejection even in the absence of any reasoning or evidentiary support, the Examiner is reminded that in determining whether a claim falls within statutory subject matter, the practical utility of the claimed invention must be considered. MPEP 2107; See also State Street Bank & Trust Co. v. Signature Financial Group Inc., 47 USPQ2d

1596, 1602 (Fed. Cir. 1998). Hence, although the aspect of “transforming” an article or physical object to a different state or thing is probative in determining § 101 compliance, it is by no means dispositive. Physical transformation “is not an invariable requirement, but merely one example of how a mathematical algorithm may bring about a useful application.” AT&T Corp. v. Excel Communications, Inc., 50 USPQ2d 1447, 1452 (Fed. Cir. 1999). As stated by the USPTO Guidelines, “[i]f the Examiner determines that the claim does not entail the transformation of an article, then the Examiner shall review the claim to determine if the claim provides a practical application that produces a useful, tangible and concrete result.” Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility, USPTO, p. 20 (hereinafter “Guidelines”).

“[I]n determining whether the claim is for a ‘practical application,’ the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claimed invention is ‘useful, tangible and concrete’.” Id. For a claimed invention to be “useful”, according to the USPTO’s official interpretation of § 101, the utility of an invention has to be specific, substantial and credible. Id. at 20-21; MPEP § 210. In regards to the tangible prong, the claim must set forth a practical application that produces a produce a real-world result. Guidelines at 21; Gottschalk v. Benson, 175 USPQ 673, 676-77 (1972). Finally, the concrete prong requires that the process have a result that can be substantially repeatable. Guidelines at 22; In re Swartz, 56 USPQ2d 1703, 1704 (Fed. Cir. 2000).

Claims 1-7 of the present application are for “[a]n apparatus in a host in a network of a plurality of hosts”. See Claim 1. Claim 1, in particular, lists a functional order of such an apparatus. The apparatus comprises:

- a unit sending a first message indicating the host boots, to all of the plurality of hosts in the network when the host in the network boots;
- a unit disabling RDMA access from the plurality of hosts to the host;
- a unit responding to the first message by sending to the host a second message;

and a unit sending a third message indicating the host is ready to accept RDMA access from the plurality of hosts, to all of the plurality of hosts after the second messages from all of the plurality of hosts have been received and the RDMA function is enabled.

Claim 1.

The inquiry is if claim 1, as a whole, provides a practical application that produces a useful, tangible and concrete result. Claim 1 is “useful” because the utility resulting from the claimed invention is indeed “specific, substantial and credible”. The ultimate result is that a host in the apparatus can boot itself and integrate, or re-integrate, itself in a network through the interplay of a number of other units, all of which allow said host to avoid problems like, for example, a host crash. Avoidance of such networking problems associated with re-booting a unit is a specific, substantial, and credible sort of utility. In regards to providing a “tangible” result, the real-world result is a sound and robust network of a plurality of hosts in which a host unit may boot or reboot efficiently. Finally, each function in claim 1 can be substantially repeated in a variety of platforms, and thus claim 1 is “concrete”. Since the results of claim 1 are ‘useful, tangible and concrete,’ it is respectfully submitted that claim 1 is statutory subject matter pursuant to § 101.

Claim 2 is dependent on claim 1 and adds the limitation “which is included in a drive of the host.” In other words, claim 2 narrows the scope of claim 1 by limiting said apparatus to those that perform said function by execution of a driver. The invention claimed in claim 2 provides the same ‘useful, tangible and concrete’ results as claim 1. Hence, it is respectfully submitted that claim 2 is statutory subject matter pursuant to § 101.

Claims 3-7 are dependent on claim 1. All said claims provide additional elements to claim 1. Nevertheless, the inventions falling under said claims generate the same result, although each additional dependent claims describes a narrower group of embodiments. Since claims 3-7 still provide the same ‘useful, tangible and concrete’ results as claim 1, it is respectfully submitted that claims 3-7 are statutory subject matter pursuant to § 101.

Claims 8-14 are method claims that provide the same ‘useful, tangible and concrete’ results as claim 1, described above. Hence, it is respectfully submitted that claims 3-7 are statutory subject matter pursuant to § 101.

REJECTION UNDER 35 U.S.C. §102:

In the Office Action, at page 2, numbered paragraphs 2-3, claims 1-14 were rejected under 35 U.S.C. §102 in view of Sugahara et al. (U.S. 6,804,673), hereinafter “Sugahara”. This rejection is traversed and reconsideration is requested.

In regards to a § 102 rejection, the Examiner is reminded that “[a] claim is anticipated [...] if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” MPEP § 2131 (quoting Verdegaal Bros. v. Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).). “The identical invention must be shown in as complete detail as is contained in the ... claim.” MPEP § 2131 (quoting Richardson v. Suzuki Motor Co., 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).). The single prior art reference must contain “each and every element of the patent at issue, operating in the same fashion to perform the identical function as the patented product.” Gillette Co. v. Warner-Lambert Co., 8 USPQ2d 1082, 1084 (D. Mass. 1988). “Thus, any degree of physical difference between the patented product and the prior art, no matter how slight, defeats the claim of anticipation.” Id. The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. MPEP § 2131 (quoting In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).). In short, according to case law and the MPEP, a claim is anticipated if all the elements are recited in the prior art, are identically set forth, and are in a single prior art reference.

The embodiments relates to an apparatus and a method for integrating, or re-integrating, host machines that have RDMA functions into a network. A computer acting as a host to other computers remotely accessing its memory is susceptible to a system crash when it re-boots due to re-setting of its RDMA settings. Appropriate integration into an RDMA network prevents crashes in a host computer when it boots and its RDMA settings are altered.

The embodiments, in short, addresses this problem by having a first host sends a message to the RDMA network of its current booting state and disable RDMA. The plurality of other hosts in the network send a responsive message confirming receipt of the ‘booting’ message. Thereafter, once the first host has received all the acknowledgement messages from the plurality of hosts, the first host enables its RDMA and sends a message that both confirms that it has booted and notifies its new RDMA settings to the plurality of hosts in the network.

This in turn allows the plurality of hosts to resume remote access with the new settings of the first host, thus preventing a system crash.

Claims 1 and 8 and New Claim 15:

In regards to claims 1 and 8, the Office Action alleges that Sugahara discloses all the elements of claims 1 and 8. The Office Action fails to see the differences between the cited elements of claims 1 and 8, and the particular text it cites.

The Sugahara reference concerns a method and system that provides access assurance regarding an RDMA transaction over a computer network. Sugahara at col. 1, lines 56-58. Said invention deals with continued RDMA transactions through the sending of access assurance information that, if encountered, will point out to an erroneous situation during the RDMA process. Sugahara at col. 1, lines 48 - 53. Said invention does not deal with maintaining the functionality of an RDMA host when the host boots for the first time, or reboots, as stipulated by the present application. The invention disclosed in Sugahara requires the continued interaction between the host and the client in the network, and does not anticipate the situation in which a host needs to be re-integrated into an RDMA network once all the access information in the host computer is re-calibrated. The goal of the Sugahara invention is only to make sure that information read from a host is correct by executing a redundancy "access assurance" interchange. See Sugahara at col. 1, line 56 – col. 2, line 18. This has nothing to do with integration, or re-integration, into the actual network. The present application is actually a precursory or subsequent operation to the process stipulated by Sugahara. As a result, some of the elements of claims 1 and 8 are not taught or suggested by the Sugahara reference.

The Office Action states that the element "[...] sending a first message indicating the host boots, to all of the plurality of hosts in the network when the host in the network boots; [...]" is disclosed by a combination of column 1, lines 45-50 and column 2 lines 7-8 of Sugahara. The Examiner is taking two sentences out of the context that each is used and combines them in order to determine that said element is disclosed.

The Examiner is referred to the first citation, which, in the context of the section it is in, reads:

Also, in order to make sure that a read access using RDMA is done properly, the device which performs the read access may have to perform the read access again and compare the read data from the two read access. These methods for RDMA assurance are time consuming and waste network resources.

Therefore, there is a need for a system and a method that allows an initiator of an RDMA to obtain access assurance that the RDMA is done properly, and/or to obtain error information if an erroneous situation occurred during the RDMA process, without going through the aforementioned procedures.

Sugahara, col. 1, lines 41-53.

The “initiator”, in the context of this quote, is the mechanism that initiates the RDMA transaction that allows a client to read and write to the memory of the host directly. See Id. at col. 1, lines 27 – 36. The selection cited by the Office Action states, in short, that there is a need to assure that the information processed during the “read and write” RDMA operation is accurate, and for there to be some error alert mechanism if the “read and write” operation is not accurate. In contrast, the relevant element of the claim, “[...] sending a first message indicating the host boots, to all of the plurality of hosts in the network when the host in the network boots; [...]”, does not relate to a type of RDMA checking system. Rather, it deals with sending a “boot” message to a plurality of hosts when the host boots. The accuracy of this message is presumed because the claimed invention does not deal with checking if the message sent to the plurality of hosts is correct. Hence, column 1, lines 45-50 of Sugahara does not teach or suggest said element.

The Examiner is also referred to the second citation, which, in the context of the section it is in, reads:

For each RDMA transaction initiated by the first device and targeted at the second device, the second PCI network adaptor also prepares access assurance information corresponding to the RDMA transaction and sends it to the first PCI network adaptor in a response packet. The access assurance information is stored in the first PCI network adaptor until it is checked by the first device.

Sugahara, col. 2, lines 7-13.

Sugahara defines PCI as a “peripheral component interconnect”. Id. at col. 1, lines 59 – 61. The above-cited quote, in short, states that the host of an RDMA connection prepares access assurance information and sends it to the other host which stores said information in order to check if the information from the “read and write” process is correct. Of course, this

quote states that a message is sent to plurality of hosts. But the Examiner is reminded that “[t]he identical invention must be shown in as complete detail as is contained in the ... claim.” MPEP § 2131. The message being sent in Sugahara is “access assurance information”, whereas the message sent in claims 1 and 8 is a message “indicating the host boots [...] when the host in the network boots”. See Claim 1; Claim 8. The two messages are distinct, and hence, the cited reference in the Office Action does not teach or suggest said element. For the abovementioned reasons, it is respectfully submitted that the element “[...] sending a first message indicating the host boots, to all of the plurality of hosts in the network when the host in the network boots; [...]” is not disclosed by Sugahara.

The Office Action also states that the element “a unit disabling RDMA access from the plurality of hosts to the host” is disclosed by column 5, lines 33-35 of Sugahara. The Office Action is taking said selection out of the context in which it is used in order to find that Sugahara discloses said element.

The Examiner is referred to said citation, which, in the context of the section it is in, reads:

In response to receiving the read request packet, the PCI network adaptor 130B at node B issues a read command and returns the requested read data to the PCI network adaptor 130A at node A. While the read transaction is in process, a retry signal is generated at node A to starve off further read requests. Once the requested read data is received at node A, the PCI network adaptor 130A completes the read transaction by returning the read data to the initiator of the read transaction.

Sugahara, col. 5, lines 30 – 38. (emphasis added)

In short, the above selection reads that during the interaction between two hosts in an RDMA transaction, one host will starve off further “read” requests while in the middle of an already ongoing read transaction. Reading the selection cited by the Examiner in the context that it is used illustrates that said selection does not teach or suggest the element stating “a unit disabling RDMA access from the plurality of hosts to the host”. First, the Sugahara does not disable RDMA access, but rather “starve[s] off”, stays, or “holds” processing of that access. See Id. This is further underscored by the fact that the staying of RDMA access is not due to a host booting, but rather to an already ongoing operation. Thus, the reference cited does not teach or suggest the element stating “a unit disabling RDMA access from the plurality of hosts to the host”. Hence, it is respectfully submitted Sugahara does not teach or suggest said element.

Finally, the Examiner also alleges that a combination of column 4, lines 4 – 8 and column 9, line 5 of Sugahara, discloses the element of claims 1 and 8 which states “indicating the host is ready to accept RDMA access from the plurality of hosts, to all of the plurality of hosts after the second messages from all of the plurality of hosts have been received and the RDMA function is enabled.”

Without quoting said references, the Examiner is referred to said citations. The first citation, in short, is about processing RDMA transactions in a PCI network adaptor, which is contingent on an address. See Sugahara, col. 4, lines 4 – 8. Said reference has nothing to do with a host sending a “ready to accept” message. Neither does said reference deal with enabling the RDMA function.

In addition, the second citation, in short, is about enabling a first RDMA to obtain assurance access information. See Sugahara, col. 9, lines 5-6. This is not the same as enabling the actual RDMA, as discussed above.

A claim is anticipated if each and every element as set forth in the claim is found, either expressly or inherently described. MPEP § 2131. As stated above, Sugahara does not teach or suggest at least 3 elements in each of claims 1 and 8. Since all the elements of said claims are not taught or suggested, it is respectfully submitted that Sugahara does not anticipate claims 1 and 8.

Additionally, new claim 15 contains the same elements stated above, of claims 1 and 8, that are not taught or suggested by Sugahara. Therefore, since all the elements of new claim 15 are not taught or suggested, it is respectfully submitted that Sugahara does not anticipate new claim 15.

Claims 2 and 9

Claims 2 and 9 are dependent on claims 1 and 8, respectively. For this reason alone, Sugahara does not anticipate claim 2 and 9. Nevertheless, claims 2 and 9 are neither taught or suggested by the citation proffered by the Office Action, column 3, lines 40 – 44 of Sugahara.

The Examiner is referred to said selection, which states:

The configuration program run by any of the nodes automatically detects the presence, type and address space requirements of the devices and allocates space to them by programming their address decoders to recognize the address range it assigns to them.

Sugahara, column 4, lines 40 – 44.

Said selection reads, in short, that address decoders are programmed in order to automatically execute a configuration program. Id. Sugahara defines a configuration program as a means to assign mutually exclusive address spaces in each PCI bus to all of the devices in a network. See Sugahara col 3, lines 33 – 36. Thus, a driver for a configuration program is distinct from a driver of “[a]n apparatus in a host in a network of a plurality of hosts, the host and the plurality of hosts having an RDMA function”; or a driver of “[a] method in a host in a network comprising a plurality of hosts, the host and the plurality of hosts having an RDMA function” as described in claims 1 and 8. As a result, this element is not taught or suggested by column 3, lines 40 – 44 of Sugahara. Hence, it is respectfully submitted Sugahara does not anticipate that claim 2.

New Claims 16 and 17

New claim 16 emphasizes updating the network of hosts concerning the booting and disabling RDMA access to the host, awaiting acknowledgment of the update message by all of the network of hosts and sending an update message to the network of hosts indicating readiness to accept RDMA access.

New claim 17 emphasizes awaiting an update indicating that from one of the hosts of the network of hosts that one of the hosts is booting, stopping RDMA accesses to the one of the hosts responsive to the update, awaiting an update that the one of the hosts is available for RDMA access and resuming RDMA accesses.

Sugahara still does teach or suggest these claims for the similar reasons as stated above.

All Other Claims

The Office Action rejects claims 3-7 and 9-14, which are dependent on claims 1 and 8, respectively. However, as it has been shown, Sugahara does not anticipate claims 1 and 8. An anticipation rejection must contain each and every element of a claim and the dependent claims cited incorporate the elements of independent claim 1 and 8. Hence, it is respectfully submitted

that Sagahura does not anticipate claims 3-7 and 9-14.

CONCLUSION:

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot. And further, that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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